

The following Listing of Claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) A pressure-energized, metallic seal for sealing axially facing annular surfaces, comprising:

a central annular portion extending around a central axis, said central annular portion having a first end and a second end;

a first annular leg portion extending from said first end of said central portion to an annular first free end, said first annular leg portion having a first annular convex sealing surface lying in a first sealing plane that is perpendicular to said central axis; and

a second annular leg portion extending from said second end of said central portion to a second free end, said second annular leg portion having a second annular convex sealing surface lying in a second sealing plane that is perpendicular to said central axis, said second free end of said second leg portion having an annular flange extending ~~substantially~~ parallel to said first and second sealing planes and offset from said second sealing plane in an axial direction towards said first sealing plane, said annular flange extending beyond said annular first free end of said first annular leg portion such that said annular flange is exposed when viewed in an axial direction from said first sealing plane toward said second sealing plane,

said central annular portion, said first annular leg portion, said second annular leg portion and said annular flange being integrally formed together as a one-piece, unitary member.

2. (Cancelled)

3. (Currently Amended) ~~A~~ The pressure-energized, metallic seal according to ~~claim 2, wherein~~ for sealing axially facing annular surfaces, comprising:

a central annular portion extending around a central axis, said central annular portion having a first end and a second end;

a first annular leg portion extending from said first end of said central portion to an annular first free end, said first annular leg portion having a first annular convex sealing surface lying in a first sealing plane; and

a second annular leg portion extending from said second end of said central portion to a second free end, said second annular leg portion having a second annular convex sealing surface lying in a second sealing plane, said second free end of said second leg portion having an annular flange extending substantially parallel to said first and second sealing planes and offset from said second sealing plane in an axial direction towards said first sealing plane, said annular flange of said second free end extending in a radial direction away from said central annular portion at least as far as said first free end,

said annular flange of said second free end including ~~includes~~ at least one radially extending tab projecting further in said radial direction than adjacent parts of said annular flange.

4. (Original) The pressure-energized, metallic seal according to claim 3, wherein
said tab includes an axial opening formed therein.

5. (Original) The pressure-energized, metallic seal according to claim 3, wherein
said tab includes an open ended slot formed therein.

6. (Original) The pressure-energized, metallic seal according to claim 2, wherein
said annular flange of said second free end includes a plurality of radially extending tabs projecting further than adjacent parts of said annular flange.

7. (Original) The pressure-energized, metallic seal according to claim 6, wherein
said plurality of tabs are peripherally spaced from each other.

8. (Original) The pressure-energized, metallic seal according to claim 7,
wherein

said annular flange of said second free end includes four of said tabs.

9. (Original) The pressure-energized, metallic seal according to claim 8,
wherein

said seal is substantially rectangular shaped as viewed along said central axis with one
of said tabs located at each corner.

10. (Original) The pressure-energized, metallic seal according to claim 8,
wherein

at least two of said tabs have an axial hole formed therein.

11. (Original) The pressure-energized, metallic seal according to claim 8,
wherein

at least two of said tabs have an open ended slot formed therein.

12. (Original) The pressure-energized, metallic seal according to claim 1,
wherein

said seal has a substantially C-shaped transverse cross-sectional profile as viewed in a
peripheral direction.

13. (Cancelled)

14. (Original) The pressure-energized, metallic seal according to claim 1,
wherein

said seal is substantially rectangular shaped with rounded corners as viewed along
said central axis.

15. (Original) The pressure-energized, metallic seal according to claim 1,
wherein

said seal has a non-circular shape as viewed along said central axis.

16. (Original) The pressure-energized, metallic seal according to claim 1, wherein
said first and second annular leg portions extend outwardly from said central annular portion in a radial direction away from said central axis.

17. (Original) The pressure-energized, metallic seal according to claim 1, wherein
said first and second annular leg portions extend inwardly from said central annular portion in a radial direction toward said central axis.

18. (Original) A pressure-energized, metallic seal for sealing axially facing annular surfaces, comprising:
a central annular portion extending around a central axis, said central annular portion having a first end and a second end;
a first annular leg portion extending from said first end of said central portion to an annular first free end, said first annular leg portion having a first annular convex sealing surface lying in a first sealing plane; and
a second annular leg portion extending from said second end of said central portion to a second free end, said second annular leg portion having a second annular convex sealing surface lying in a second sealing plane, said second free end having at least one radially extending tab projecting further than adjacent parts of said seal.

19. (Original) The pressure-energized, metallic seal according to claim 18, wherein
said tab includes an axial opening formed therein.

20. (Original) The pressure-energized, metallic seal according to claim 18, wherein
said tab includes an open ended slot formed therein.

21. (Original) The pressure-energized, metallic seal according to claim 18, wherein

said second free end of said second leg portion includes a plurality of radially extending tabs projecting further than adjacent parts of said seal.

22. (Original) The pressure-energized, metallic seal according to claim 21, wherein

said plurality of tabs are peripherally spaced from each other.

23. (Original) The pressure-energized, metallic seal according to claim 22, wherein

said second free end of said second leg portion includes four of said tabs.

24. (Original) The pressure-energized, metallic seal according to claim 23, wherein

said seal is substantially rectangular shaped as viewed along said central axis with one of said tabs located at each corner.

25. (Original) The pressure-energized, metallic seal according to claim 23, wherein

at least two of said tabs have an axial hole formed therein.

26. (Original) The pressure-energized, metallic seal according to claim 23, wherein

at least two of said tabs have an open ended slot formed therein.

27. (Previously Presented) The pressure-energized, metallic seal according to claim 18, wherein

said seal has a substantially C-shaped transverse cross-sectional profile as viewed in a peripheral direction.

28. (Previously Presented) The pressure-energized, metallic seal according to claim 18, wherein

said central portion, said first leg portion and said second leg portion are constructed together as a one-piece, unitary member.

29. (Previously Presented) The pressure-energized, metallic seal according to claim 18, wherein

said seal is substantially rectangular shaped with rounded corners as viewed along said central axis.

30. (Previously Presented) The pressure-energized, metallic seal according to claim 18, wherein

said seal has a non-circular shape as viewed along said central axis.

31. (Previously Presented) The pressure-energized, metallic seal according to claim 18, wherein

said first and second annular leg portions extend outwardly from said central annular portion in a radial direction away from said central axis.

32. (Previously Presented) The pressure-energized, metallic seal according to claim 18, wherein

said first and second annular leg portions extend inwardly from said central annular portion in a radial direction toward said central axis.

33. (Currently Amended - Withdrawn) A method of manufacturing a pressure-energized, metallic seal, comprising:

feeding a metal sheet material into a sheet metal forming machine;

cutting a first annular edge of the pressure-energized, metallic seal in the metal sheet material that extends around a central axis;

bending a portion of the metal sheet material to form a cross-sectional profile of the pressure-energized, metallic seal that includes

a central annular portion extending around the central axis, the central annular portion having a first end and a second end,
a first annular leg portion extending from the first end of the central portion to an annular first free end with the first annular edge, the first annular leg portion having a first annular convex sealing surface lying in a first sealing plane that is perpendicular to the central axis, and
a second annular leg portion extending from the second end of the central portion, the second annular leg portion having a second annular convex sealing surface lying in a second sealing plane that is perpendicular to the central axis; and
cutting a second annular edge of the pressure-energized, metallic seal in the metal sheet material to form a second free end of the second leg portion having an annular flange extending ~~substantially~~ parallel to the first and second sealing planes and offset from the second sealing plane in an axial direction towards the first sealing plane such that the central annular portion, the first annular leg portion, the second annular leg portion and the annular flange are integrally formed together as a one-piece, unitary member,
the cutting of the second annular edge of the pressure-energized, metallic seal occurs at a radial position such that the annular flange of the second free end extends beyond the annular first free end of the first annular leg portion and such that the annular flange is exposed when viewed in an axial direction from the first sealing plane toward the second sealing plane.

34. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein
the bending of the portion of the metal sheet material is performed using an automated progressive pressing operation.

35. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein
the cutting of the first annular edge of the pressure-energized, metallic seal occurs before the bending of the portion of the metal sheet material; and
the bending of the portion of the metal sheet material occurs before the cutting of the second annular edge of the pressure-energized, metallic seal.

36. (Cancelled)

37. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein
the cutting of the second annular edge of the pressure-energized, metallic seal creates at least one radially extending tab that projects in a radial direction from the annular flange, the at least one tab projecting further in the radial direction than adjacent parts of the annular flange.

38. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 37, further comprising
cutting an axial opening in the at least one tab.

39. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 37, further comprising
cutting an open ended slot in the at least one tab.

40. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein
the cutting of the second annular edge of the pressure-energized, metallic seal creates a plurality of radially extending, peripherally spaced tabs that project in a radial direction from the annular flange, the tabs projecting further in the radial direction than adjacent parts of the annular flange.

41. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 40, wherein
the cutting of the second annular edge of the pressure-energized, metallic seal creates four of the tabs.

42. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 41, further comprising

cutting an axial hole in at least two of the tabs.

43. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 41, further comprising cutting an open ended slot in at least two of the tabs.

44. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein the bending of the portion of the metal sheet material creates a substantially C-shaped transverse cross-sectional profile as viewed in a peripheral direction.

45. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein the cutting the first annular edge of the pressure-energized, metallic seal creates a non-circular shape as viewed along the central axis; and the cutting the second annular edge of the pressure-energized, metallic seal creates a non-circular shape as viewed along the central axis.

46. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein the first annular edge is moved axially and radially outwardly relative to the central axis during the bending of the portion of the metal sheet material such that the first and second annular leg portions extend outwardly from the central annular portion in a radial direction away from the central axis.

47. (Original - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim 33, wherein the first annular edge is moved axially and radially inwardly relative to the central axis during the bending of the portion of the metal sheet material such that the first and second annular leg portions extend inwardly from the central annular portion in a radial direction toward the central axis.

48. (Previously Presented) A pressure-energized, metallic seal for sealing axially facing annular surfaces, comprising:

a central annular portion extending around a central axis, said central annular portion having a first end and a second end;

a first annular leg portion extending from said first end of said central portion to an annular first free end, said first annular leg portion having a first annular convex sealing surface lying in a first sealing plane; and

a second annular leg portion extending from said second end of said central portion to a second free end, said second annular leg portion having a second annular convex sealing surface lying in a second sealing plane, said second free end of said second leg portion having an annular flange extending substantially parallel to said first and second sealing planes and offset from said second sealing plane in an axial direction towards said first sealing plane,

said seal having a substantially uniform thickness with said annular flange projecting radially beyond said first free end by a distance no larger than said thickness.

49. (Previously Presented) The pressure-energized, metallic seal according to claim 48, wherein

said annular flange of said second free end extends in a radial direction away from said central annular portion at least as far as said first free end.

50. (Previously Presented) The pressure-energized, metallic seal according to claim 49, wherein

said annular flange of said second free end includes at least one radially extending tab projecting further in said radial direction than adjacent parts of said annular flange.

51. (Previously Presented) The pressure-energized, metallic seal according to claim 50, wherein

said tab includes an axial opening formed therein.

52. (Previously Presented) The pressure-energized, metallic seal according to claim 50, wherein

said tab includes an open ended slot formed therein.

53. (Previously Presented) The pressure-energized, metallic seal according to claim 49, wherein

said annular flange of said second free end includes a plurality of radially extending tabs projecting further than adjacent parts of said annular flange.

54. (Previously Presented) The pressure-energized, metallic seal according to claim 53, wherein

said plurality of tabs are peripherally spaced from each other.

55. (Previously Presented) The pressure-energized, metallic seal according to claim 54, wherein

said annular flange of said second free end includes four of said tabs.

56. (Previously Presented) The pressure-energized, metallic seal according to claim 55, wherein

said seal is substantially rectangular shaped as viewed along said central axis with one of said tabs located at each corner.

57. (Previously Presented) The pressure-energized, metallic seal according to claim 55, wherein

at least two of said tabs have an axial hole formed therein.

58. (Previously Presented) The pressure-energized, metallic seal according to claim 55, wherein

at least two of said tabs have an open ended slot formed therein.

59. (Previously Presented) The pressure-energized, metallic seal according to claim 48, wherein

said seal has a substantially C-shaped transverse cross-sectional profile as viewed in a peripheral direction.

60. (Previously Presented) The pressure-energized, metallic seal according to claim 48, wherein

said central portion, said first leg portion and said second leg portion are constructed together as a one-piece, unitary member.

61. (Previously Presented) The pressure-energized, metallic seal according to claim 48, wherein

said seal is substantially rectangular shaped with rounded corners as viewed along said central axis.

62. (Previously Presented) The pressure-energized, metallic seal according to claim 48, wherein

said seal has a non-circular shape as viewed along said central axis.

63. (Previously Presented) The pressure-energized, metallic seal according to claim 48, wherein

said first and second annular leg portions extend outwardly from said central annular portion in a radial direction away from said central axis.

64. (Previously Presented) The pressure-energized, metallic seal according to claim 48, wherein

said first and second annular leg portions extend inwardly from said central annular portion in a radial direction toward said central axis.

65. (Currently Amended - Withdrawn) The method of manufacturing the pressure-energized, metallic seal according to claim ~~33~~ 36, wherein

the cutting of the second annular edge of the pressure-energized, metallic seal occurs at a radial position such that the annular flange of the second free end extends in a radial direction away from the central annular portion beyond the first free end by a distance no larger than a thickness of the seal.

66. (New - Withdrawn) A method of manufacturing a pressure-energized, metallic seal, comprising:

- feeding a metal sheet material into a sheet metal forming machine;
- cutting a first annular edge of the pressure-energized, metallic seal in the metal sheet material that extends around a central axis;
- bending a portion of the metal sheet material to form a cross-sectional profile of the pressure-energized, metallic seal that includes
 - a central annular portion extending around the central axis, the central annular portion having a first end and a second end,
 - a first annular leg portion extending from the first end of the central portion to an annular first free end with the first annular edge, the first annular leg portion having a first annular convex sealing surface lying in a first sealing plane, and
 - a second annular leg portion extending from the second end of the central portion, the second annular leg portion having a second annular convex sealing surface lying in a second sealing plane; and
- cutting a second annular edge of the pressure-energized, metallic seal in the metal sheet material to form a second free end of the second leg portion having at least one radially extending tab projecting further than adjacent parts of the seal.

67. (New - Withdrawn) A method of manufacturing a pressure-energized, metallic seal, comprising:

- feeding a metal sheet material with a substantially uniform thickness into a sheet metal forming machine;
- cutting a first annular edge of the pressure-energized, metallic seal in the substantially uniform thickness metal sheet material that extends around a central axis;
- bending a portion of the substantially uniform thickness metal sheet material to form a cross-sectional profile of the pressure-energized, metallic seal that includes
 - a central annular portion extending around the central axis, the central annular portion having a first end and a second end,
 - a first annular leg portion extending from the first end of the central portion to an annular first free end with the first annular edge, the first annular leg portion having a first annular convex sealing surface lying in a first sealing plane, and

a second annular leg portion extending from the second end of the central portion,
the second annular leg portion having a second annular convex sealing surface
lying in a second sealing plane; and

cutting a second annular edge of the pressure-energized, metallic seal in the
substantially uniform thickness metal sheet material to form a second free end of the second
leg portion having an annular flange extending substantially parallel to the first and second
sealing planes and offset from the second sealing plane in an axial direction towards the first
sealing plane such that the central annular portion, the first annular leg portion, the second
annular leg portion and the annular flange have the same substantially uniform thickness,

the cutting of the second annular edge of the pressure-energized, metallic seal occurs
at a radial position such that the annular flange of the second free end extends radially beyond
the first free end by a distance no larger than the substantially uniform thickness.